120.890: LOW-LEVEL RADIOACTIVE WASTE MINIMIZATION REGULATIONS GENERAL PROVISIONS

120.891: Purpose and Scope

(A) The purpose of 105 CMR 120.890 is to ensure that source and volume minimization and storage for decay are integral parts of every radioactive material user's, as well as generator's, waste management program. 105 CMR 120.890 has been made, after consultation with the Board, as required in M.G.L. c. 111H, § 13.

(B) 105 CMR 120.890 apply to all radioactive material users, licensees and generators as defined in 105 CMR 120.893.

(C) 105 CMR 120.890 do not apply to radioactive materials that are exempt from licensing as specified in 105 CMR 120.100.

(D) The requirements of 105 CMR 120.890 are in addition to, and not in substitution for, 105 CMR 120.001, 120.100, 120.200 and 120.800.

120.892: Regulatory Authority

The authority for the Department of Public Health to promulgate 105 CMR 120.890 is found in: M.G.L. c. 111, §§ 3, 5M, 5N, 5O, 5P; M.G.L. c. 111H, §§ 1, 7, 8, 11, 13, 16, 31.

120.893: Definitions

As used in 105 CMR 120.890, the following definitions apply:

Board means the Low-Level Radioactive Waste Management Board established in M.G.L. c. 111H, §2.

Days means calendar days; provided that in computing time periods such periods shall exclude the day of the, event which starts the period running, and further provided that if the last day of a period falls on a Sunday, legal holiday or declared state of emergency day, such period shall be extended to the close of business on the next business day.

Department means the Department of Public Health.

Development means all activities undertaken with respect to a low-level radioactive waste facility during the period commencing with the selection of any superior site pursuant to M.G.L. c. 111H, § 23 and continuing until the commencement of facility operation pursuant to M.G.L. c. 111H, § 39.

Disposal means the isolation of low-level radioactive waste from the biosphere inhabited by human beings and their food chains.

Generator means a person, including a broker, who produces low-level radioactive waste.

Generator guidance means the document titled *Low-Level Radioactive Waste Minimization Guidance* compiled by the Department for the guidance of waste generators.

Half-life means the time in which half the atoms of a particular radioactive substance disintegrate to another nuclear form.

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Licensee means a person holding a license issued pursuant to 105 CMR 120.100 by the Department of Public Health to transfer, acquire, own, possess or use quantities of, or devices or equipment utilizing, radioactive material.

Low-level radioactive waste means radioactive material that"

(1) is neither high-level waste, nor spent nuclear fuel, nor by-product material as defined in section 11(e)(2) of the Atomic Energy Act of 1954, as amended, 42 U.S.C. §2014(e); and

(2) is classified by the Federal Government as low-level radioactive waste, but not including waste which remains a Federal responsibility, as designated in section 3(b) of the Low-Level Radioactive Waste Policy Act, as amended, 42 U.S.C. §2021c(b), as in effect as of December 8, 1987.

Management means the storage, packaging, treatment, transportation, or disposal, where applicable, of low-level radioactive waste.

Management plan means the low-level radioactive waste management plan adopted by the board pursuant to M.G.L. c. 111H, § 12 to provide for the safe and efficient management of low-level radioactive waste.

Manifest means a detailed record of the characteristics and quantities of packaged waste as presented for transportation, treatment, storage, or disposal which usually accompanies waste transfers for these purposes.

Minimization plan means the plan required by each generator which identifies actions to allow for "storage for decay" of short-lived radioisotopes, and actions to achieve source and volume minimization.

Mixed waste means low-level radioactive waste containing material that either:

(1) is listed in 310 CMR 30.131 through 30.136; or

(2) causes the waste to exhibit any of the characteristics identified in 310 CMR 30.120.

Person means any agency or political subdivision of the federal government or the commonwealth, or of any state, any public or private corporation or authority, individual, firm, joint stock company, partnership, association, trust, estate, institution or other entity, and any officer, employee or agent of such person, and any group of such persons.

Radioactive material means any solid, liquid, or gas which emits radiation spontaneously.

Radioactive material user means any person who requires a license or registration with the Department of Public Health pursuant to 105 CMR 120.000 to use radioactive materials for any purpose.

Radioactivity means the transformation of unstable atomic nuclei with the emission of radiation.

Source minimization means minimizing the volume of radioactivity of low-level radioactive waste prior to its generation by such methods as:

(1) avoiding unnecessary contamination of items during the use of radioactive materials;

(2) carefully segregating radioactive waste from non-radioactive trash; or

(3) substituting non-radioactive isotopes or radioisotopes with shorter half-lives where practicable.

Storage means the holding of low-level radioactive waste for treatment or disposal.

Storage for decay means a procedure in which low-level radioactive waste with a relatively short half-life is held for natural radioactive decay in compliance with applicable federal and state regulations.

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Treatment means any method, technique, or process including source minimization, volume minimization, and storage for decay, designed to change the physical, radioactive, chemical, or biological characteristics or composition of low-level radioactive waste in order to render such waste safer for management, amenable for recovery, convertible to another usable material or reduced in volume.

Volume minimization means treatment of low-level radioactive waste after its generation in order to minimize the physical dimensions of the waste and the space required for disposal.

Waste means low-level radioactive waste.

Waste Facility means a facility that is licensed in Massachusetts for the purposes of treating, storing or disposing of low level radioactive waste.

120.895: Objectives

The following are the objectives of 105 CMR 120.890:

(A) To protect public health and safety and the environment by ensuring that radioactive material users avail themselves of all the opportunities to produce less waste.

(B) To minimize the use of radioactive sources (this is a major objective of the Department's minimization program).

(C) To reduce the amount of waste requiring treatment, storage and disposal. To this end all radioactive materials users should strive to achieve "zero production" of low-level radioactive waste and frivolous or unnecessary uses of radioactive materials should be avoided, especially if non-radioactive alternatives are available.

(D) To ensure waste material is well characterized so as to reduce disposal liabilities and conserve disposal capacity.

(E) To permit evaluation of the waste generation activity, allowing for optimal minimization controls that are consistent with waste management policies and procedures authorized by federal and state law and regulation as of December 8, 1987.

(F) To identify opportunities to achieve source minimization, volume minimization and storage for decay. These opportunities shall include activities required in M.G.L. c. 111H, § 13, including avoiding unnecessarily contaminating items while using radioactive materials; segregating radioactive waste from non-radioactive trash; and identifying the objective of substituting short-lived radionuclides or non-radioactive materials for long-lived radionuclides, where possible.

(G) To be consistent with the promotion of responsible research and innovation.

120.896: Statement and Plan Requirements

All radioactive material users and generators of low-level radioactive waste are required to examine their operations and institute waste minimization/reduction/elimination programs as follows:

(A) All radioactive material users, as well as all generators, of low-level radioactive waste must prepare a statement indicating the measures they have taken to minimize/ reduce/eliminate any waste that may result from their operations. The statement should contain the rationale for the use of a radioactive material, the quantities proposed, and the choice of radionuclide. The statement should contain a consideration of the fate of any anticipated radioactive waste that would be generated.

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(B) Those persons whose operations result in 100 cubic feet or more of waste per annum, and such waste requires disposal, must develop and institute waste minimization programs predicated on detailed plans. The required elements of such a waste minimization program are described in 105 CMR 120.897.

(C) A minimization statement or plan, as applicable, shall be submitted with each new application for a license to manufacture, produce, transfer, receive, acquire, own, possess, or use radioactive materials. Current licensees shall submit a minimization statement or plan within 90 days of the promulgation of 105 CMR 120.890. The minimization statement or plan shall be updated yearly as part of the annual survey required by M.G.L. c. 111H, § 7.

(D) Persons who do not require a license from the Department for their operations but require access to a waste facility licensed by the Department shall submit, pursuant to 105 CMR 120.890, a statement or plan regarding their waste which shall be updated yearly as part of the annual survey required by M.G.L. c. 111H, § 7.

(E) The Department shall evaluate each minimization statement or plan submitted pursuant to 105 CMR 120.896(D) in accordance with the provisions of 105 CMR 120.895, 120.896, 120.897, and upon approval, shall issue a certificate.

(F) The approved minimization statement or plan shall be written into the license as a condition of the license as required in 105 CMR 120.100.

120.897: Waste Minimization Plan Content

A waste minimization plan shall include:

(A) A waste minimization policy statement that presents the generator's goals for achieving waste minimization/reduction/elimination, and assigns responsibility to an individual or group to accomplish the objectives. The plan shall be approved by the highest official of the company or institution or his/her designee, and include a statement committing to a defined implementation schedule.

(B) A summary report which characterizes the generator's waste streams and assesses the opportunities for waste minimization. The report shall include a systematic review of processes, current applicable technologies, procedures and cost requirements. An operational assessment of the generator's activities will be required in order to collect the necessary data and compile the summary report. Sample assessment forms and a flow chart illustrating the assessment overview can be found in the Department's *Low-Level Radioactive Waste Minimization Guidance*. The following assessment activities are expected to be included in the waste minimization plan and will be used to evaluate the plan:

(1) A description of the facility and the process or service that generates the waste. This may be accomplished by reviewing design, operating and maintenance documentation.

(2) Identification and characterization of the waste streams which result from the process or service. Potential sources of information include process flow diagrams, analytical test data, waste shipment manifests, radioactive material purchase and inventory records.

(3) Prioritization of the radioactive sources and waste streams to select one or more for minimization. Concerns which should be addressed when making this selection will include:

- minimization potential
- reclassification potential
- compliance with current and future regulations
- potential liability
- volume and activity of the waste
- cost/benefit relationship

(4) Analysis and selection of a technically-feasible minimization technique or technology. The process or service that generates the waste will be analyzed relative to the candidate techniques or technologies. If techniques or technologies have been developed, and minimization is believed to have reached optimum levels, the summary report will indicate what activities will allow minimization to continue.

(5) Analysis of the direct and indirect capital costs and operating costs associated with the minimization activity as compared to on-site storage and increasing disposal costs.

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(6) Evaluation of both tangible and intangible benefits and detriments of minimization.

(7) Evaluation of the progress or success of the minimization effort. This action should be undertaken periodically after minimization plans are instituted.

(8) An operational assessment whenever a new product or substantial change in service is being considered.

(9) Procedures which rely on reduction of the radioactivity of the waste through decay in storage. These should include the following:

(a) Identification of the radioisotopes and waste which can be considered for decay in storage, and development of a written set of procedures outlining handling and processing steps necessary to isolate those wastes.

(b) Identification of an area where the storage for decay can occur, and evaluation of the size of the area to ensure it is spacious enough to accommodate all wastes to be accumulated through the entire decay cycle.

(c) Identification of adjacent unrestricted areas to ensure adequate shielding is available to maintain radiation levels below specified limits.

(d) Establishment of adequate security measures for the storage for decay area.

(e) Establishment of a radiation survey procedure to measure radiation levels in adjacent unrestricted areas at least weekly.

(f) Development of written procedures to monitor the waste in the storage for decay area to ensure it has decayed to background levels prior to disposal.

(g) Maintenance of all records for all storage for decay and disposal activities, especially radiation surveys.

(C) Specification of the considerations necessary to achieve the required goals. These considerations shall include:

(1) The scope of work necessary to develop and implement the program;

(2) A best estimate of the schedule for implementing each identified task;

(3) Requirements for anticipated personnel, materials and equipment;

(4) A range of cost estimates of all program elements; and

(5) If a minimization program is already in place, the measures necessary to allow minimization to continue at an optimum level should be indicated.

(D) A statement describing how future business plans will evaluate source and volume minimization for the expected waste streams.

(E) A description of the strategies to be used to measure the success of the minimization program.

(F) A summary of employee training activities which ensure that:

(1) All employees who work with radioactive materials have basic knowledge of common waste problems;

(2) All workers involved directly with the minimization program have the necessary technological skills.

[Note: Guidance for the preparation of a minimization plan may be found in the Generator Guidance which is available from the Department.]